

Claims

1. A process for producing a liquid energy carrier from a synthesis gas which is produced by gasification of a solid carbon carrier in a plant which comprises at least a drying apparatus for drying the carbon carrier, a gasification apparatus for gasifying the carbon carrier and for producing the synthesis gas, a synthesis apparatus for the synthesis of the liquid energy carrier from the synthesis gas and an apparatus for the electrolysis of water for producing oxygen as gasification agent for the gasification process in the gasification apparatus and hydrogen for the synthesis process in the synthesis apparatus, characterized in that at least part of the off-vapor from the drying apparatus and at least part of the residual gas obtained in the synthesis is fed to the gasification process in the gasification apparatus.
2. The process as claimed in claim 1, characterized in that carbon-containing residues from the gasification apparatus and part of the oxygen produced in the apparatus for the electrolysis of water are fed to the combustion process in a combustion apparatus within the compact plant.
3. The process as claimed in claim 1 or 2, characterized in that the solid carbon carrier selected is one which has a reduced heating value and is, in accordance with its starting structure, conditioned to the required extent before introduction into the drying apparatus.
4. The process as claimed in claim 2, characterized in that the CO₂- and oxygen-containing offgas from the combustion apparatus is fed as gasification

agent to the gasification apparatus.

5. The process as claimed in any of claims 1 to 4,
characterized in that the drying process for the
carbon carrier in the drying apparatus for
producing an off-vapor which is free of
incondensable components is carried out in a
closed system and without entraining air.
6. The process as claimed in any of claims 1 to 5,
characterized in that the off-vapor from the
drying apparatus which is not fed to the
gasification process in the gasification apparatus
is condensed in a condenser.
7. The process as claimed in any of claims 1 to 6,
characterized in that the synthesis gas is
subjected to purification and/or cooling before
introduction into the synthesis apparatus.
8. The process as claimed in any of claims 2 to 7,
characterized in that residues from the gas
purification and/or residual gas from the
synthesis apparatus which is not fed to the
gasification process in the gasification apparatus
are/is fed to the combustion process in the
combustion apparatus.
9. The process as claimed in any of claims 1 to 8,
characterized in that the waste heat obtained in
the gasification process and/or the synthesis of
the liquid energy carrier and/or, if appropriate,
the combustion process and/or the gas purification
and cooling is introduced into the drying
apparatus.
10. A plant for producing a liquid energy carrier from
a synthesis gas which is produced by gasification

of a solid carbon carrier, which comprises at least a drying apparatus for drying the carbon carrier, a gasification apparatus for gasifying the carbon carrier, a synthesis apparatus for the synthesis of the liquid energy carrier from the synthesis gas and an apparatus for the electrolysis of water for producing oxygen as gasification agent for the gasification process in the gasification apparatus and hydrogen for the synthesis process in the synthesis apparatus, characterized in that a combustion apparatus which is connected to the outlet for carbon-containing gasification residues from the gasification apparatus and the oxygen outlet of the apparatus for the electrolysis of water is present.

11. The plant as claimed in claim 10, characterized in that the gasification apparatus is connected to the outlet for a residual gas from the synthesis on the synthesis apparatus.

12. The plant as claimed in claim 10 or 11, characterized in that an apparatus for gas purification and/or cooling is present between the gasification apparatus and/or the synthesis apparatus and/or the combustion apparatus.

13. The plant as claimed in any of claims 10 to 12, characterized in that at least one apparatus for gas purification and/or cooling is configured as a fluidized-bed apparatus with integrated steam generation and the outlet for the steam is connected to an inlet for heating steam on the drying apparatus.

14. The plant as claimed in any of claims 10 to 13, characterized in that a waste heat collection apparatus which collects the waste heat from the

gasification apparatus and/or the synthesis apparatus and/or the combustion apparatus and passes it to the drying apparatus is present.

- 5 15. The plant as claimed in any of claims 10 to 14,
characterized in that the outlet for the off-vapor
from the drying apparatus and/or the outlet for
the residual gas from the synthesis apparatus is
connected to the gasification apparatus and a
10 device for regulating the amount of off-vapor
and/or residual gas is present in this connection.